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ABSTRACT

Responses to a survey of the environment for research in the natural sciences at predominantly undergraduate universities were received from 136 institutional representatives and more than 2,900 faculty members. There was a nearly uniform acknowledgement that time was a limiting factor for research, and that faculty had reached their limits. Faculty at undergraduate institutions have seen a reduction in their formal teaching loads over the last 40 years, as data from other studies show, but the increased emphasis on active learning and discovery-based education and increased expectations of research engagements with students are taking greater amounts of faculty time. Faculty make additional efforts to attract and retain students and spend increasing amounts of time on administrative duties without being compensated by release time from other duties. Both teaching and research require more time than they did in the past. Time is not the only factor limiting research, but it appears to be an important one. (SLD)

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Faculty Time

Research Corporation

August 2002

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Research Corporation SPECIAL REPORT AUGUST 2002

ACADEMIC EXCELLENCE

A study of the role of research in the natural sciences at undergraduate institutions

Faculty Time

The responses to the surveys from 136 institutional representatives prepared us for what we found in the more than 2,900 faculty surveys — an enormous outpouring of concern and complaint about the time available for research or for anything else, for that matter. We did not specifically ask for written comments about time. In fact, the issue of time was only embedded in a question on allocation of time by percentages, for which we received comments like the following:

"There's more to do, you have to do it faster, you somehow have to slide things — *like trying to fill out surveys like this one* — into the cracks around everything else. Nowhere, for instance, did I find a bullet to fill in saying that I'm making [time allocation] percentages out of a 60-hour week"

What was so amazing to us is the uniform acknowledgment that time was rate limiting and that faculty had reached their limits. Where did the increase come from? Answers to "Trends in Allocation of Time" do not provide an answer. Responses from both institutional representatives (Figure 1) and faculty (Figure 2) show remarkable agreement. There really hasn't been a significant change overall in allocation of time, although individuals may perceive significant changes. To this one faculty respondent wrote:

"In recent years my institution has placed a much higher emphasis on grants and publications. At the same time the teaching loads remain among the highest in the nation (20 contact hours per week). What results is people working longer hours (the percentage of allocation of time is the same) and actually enjoying their lives less."

Figure 1. Trends in allocation of time 1991 - 2000, institutional opinion

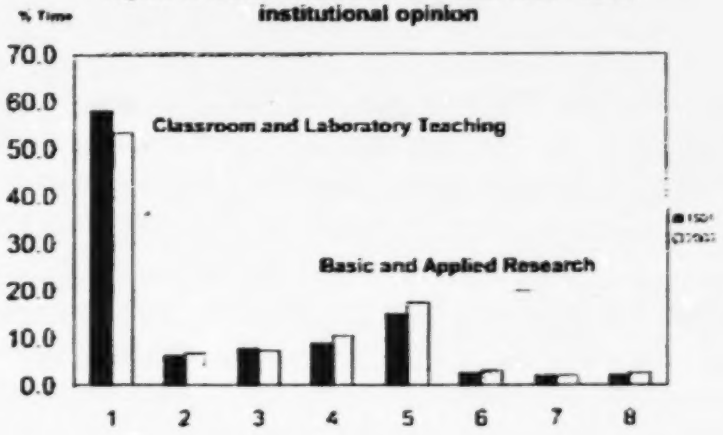
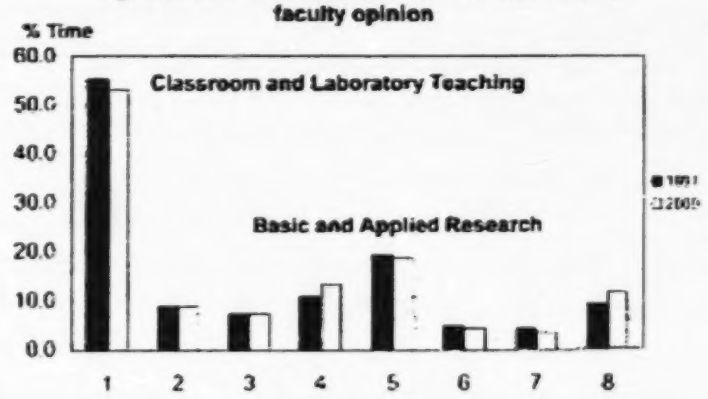


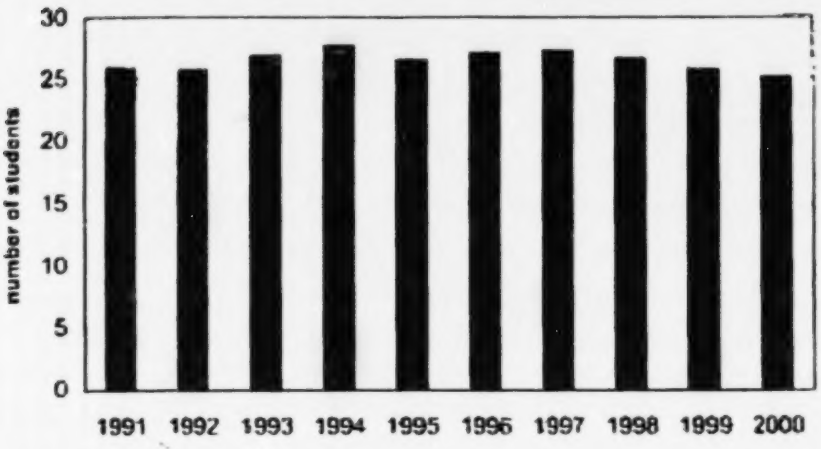
Figure 2. Trends in allocation of time 1991 - 2000, faculty opinion



KEY

1. Classroom and laboratory teaching (including preparation time)
2. Pedagogical research and curriculum development (including proposals, presentations and papers)
3. Advising students on matters other than research
4. Administration, committee work and campus correspondence
5. Basic/applied research (incl. reading, planning, writing, giving talks & advising)
6. Science-related community outreach
7. External consulting
8. Other

Figure 3. Average Number of Students in the Natural Sciences at Study Institutions 1991 - 2000, per Course



You will note that there is a problem in this argument. If teaching loads are high and have not changed over the decade, then the increased emphasis on research at that institution could not have resulted in "people working longer hours" without also resulting in an increase in allocation of time for research. Another respondent gives what seems to be the same explanation, but in different words: "The major barrier to meeting expectations is that there has not been a comparable reduction in other responsibilities; instead the generation of publishable research has been tacked on to an already heavy workload."

There is real frustration expressed in the statement made by one faculty respondent that expresses what we know many can amplify: "The biggest barrier to performance of research is *time*. There is simply not enough time for us to do our jobs (excellent teaching, advising of students, participation in university governance, and maintenance of vital research programs with students) in a normal work week, and thus our faculty spend in excess of 60 hours a week trying to fulfill these expectations. What often gets short shift — because it seems less urgent — is research."

Where has the time gone?

What are the facts? Faculty at undergraduate institutions have seen a reduction in their formal teaching loads over the past forty years. In the 1960s the 16-contact-hour workload was most common. Now it's 12-contact hours. In the 1960s most institutions that counted teaching credit hours held a 3-contact hour lab as one credit hour of a 12-credit hour teaching load. There has been improvement since that time. In the 1990s the average number of students in the natural sciences per course (Figure 3) decreased somewhat. The number of natural science faculty per institution actually increased by twenty percent during that decade. At the same time, however, there has been increased emphasis on active learning and discovery-based education as well as increased expectations for research engagements with students. On one aspect of these increased expectations, one institutional representative wrote:

"The irony of IT's promise is that this 'labor-saving device' increases work rather than decreasing it. For example: a faculty member who creates a website for a class and maintains it properly may be rewarded by enhancements in student engagement with learning, but will be roundly punished by finding the large amount of time required to develop and maintain the website."

But another faculty member wrote: "Ten years ago I might teach two or three sections in two courses with a 12–13 contact hour (load) and 40 to 70 students. Now I teach one or two courses with a nine contact hour load and 70 to 100 students." And from another institution: "Even with the proposed reduction in load to 9/9, the heavy time commitment to teaching precludes most faculty from successfully pursuing an aggressive research program that will compete successfully for extramural funding. In the twelve years that I have been at [my institution], time has always been in short supply."

Couple this with additional efforts of faculty to attract and retain students, the expectation that stu-

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dents should "enjoy" the learning experience, and the obligations placed upon faculty, especially on those who have minority representation, in shared governance, and you can see the multiplication of hours without a reduction in expectations elsewhere. And at very many institutions it is the faculty who set up the labs, maintain the instruments, and order supplies. Faculty size has grown, but is faculty size commensurate with the overall "load" and performance expectations of the faculty? One faculty addressed this in the following way:

"Thus faculty are being asked to spend increasing amounts of time on administrative duties (radiation safety, chemical hygiene, more duties associated with chairing a department, development of interdisciplinary curricula, recruitment of new students in the admission process, etc.) without being compensated by release time from other duties. The outcome of these demands on our time has been increased frustration, and a decline in morale because time for scholarly efforts has been crowded out."

But one faculty member offered one solution to the time constraints: "The culture of our department is supportive of faculty need to compartmentalize 'available' time and 'not available' time, compared to [the] situation of faculty at other institutions who are required to have a 100% open-door policy. This is very important for balancing teaching and research [and] contributes to the quality of both activities."

Are teaching and research in conflict?

Teaching requires more time today than times past, and so does research. Research can no longer be a summer experience, undertaken once classes are complete. Successful research is a continual effort that intensifies in the summer but must progress with regularity during the academic year. Yet the message that we hear is "Heavy teaching loads leave little time in a normal daily schedule for research, particularly when a block of several hours [is] needed. Faculty at [this institution] often work on weekends and the summer to continue moving forward in research. In my own case, I have five articles in various stages of review for publication because I spent this summer exclusively on research. These were begun over the last four years, but I could not complete and submit [them] during the academic year. Trying to get articles completed during the academic year has been quite difficult, even with course release, because there are so many teaching and service responsibilities." Another faculty member writes: "I find that most of my research gets done by students in my lab. I spend at least ten hours per week working with students in my lab or making sure [the] equipment is operational, but this leaves little time for writing."

Are teaching and research in conflict, with time being the universal constant? One faculty member wrote, "As the bar for doing original research is raised higher and higher, it has become increasingly difficult in recent years to excel in both teaching and research. At institutions where teaching is emphasized, this is an even more difficult task, as we try to find time to keep our courses current, teach high-quality inquiry-based courses, and still find time to maintain an active research program."

"There are a thousand reasons not to do it"

But is it time alone that is the limiting factor for productive research at predominantly undergraduate institutions? Two responses from institutional representatives offer alternative explanations:

"As faculty grow older, some of them develop other interests or have a reduced interest in traditional academic research. This really is exacerbated by the perception that after promotion and tenure decisions have been made there are not clear rewards for continued research activities (nor clear penalties for the lack of such activity)." And this comment is consistent with one from a faculty member: "Faculty [are] pulled in several directions — they have obligations to the students in their courses and component laboratories. They must train and supervise independent students. And they have various advising, departmental, college-wide, and other responsibilities. Most junior faculty do work at research during summers. After doing so for many years, most senior faculty members stop. In part, this is because of simple fatigue."

The one that I especially like to quote is: "Many would insist that the major obstacle to research is

lack of time. I'm not persuaded. To be sure, life at a private liberal arts college requires balancing teaching, research and college service, and it can be very strenuous. However, doing research usually arises from a passion for it and thrives off a psychology that finds it rewarding. There are a thousand reasons not to do it. But those reasons often apply equally to those who do and those who don't." Unfortunately, we did not find a comparable comment from the faculty surveys.

We have more to learn from this dialog. An extensive compilation of comments from faculty and institutional representatives will be available from Research Corporation this fall.

— Michael P. Doyle

PLEASE NOTE:

The SourceBook is now out of print. At the time we go to press with this newsletter, Sections 1, 2 and 8 of *The SourceBook*, as well as the introduction, are available in PDF format on the Research Corporation Web site, www.rescorp. org. More sections will be added in upcoming months.

ACADEMIC EXCELLENCE

Results from a comprehensive study of the environment for research in the natural sciences at predominantly undergraduate colleges and universities were published in June 2001 in *Academic Excellence: The SourceBook*—539 pages of data and opinions which constitute an important resource for defining the current status of the natural sciences at the 136 surveyed institutions and in the broader universe of undergraduate institutions. These schools have served as a national resource for a significant proportion of students who undertake professional careers in the sciences, and a primary reason cited for their output has been the research experiences of undergraduate students with faculty mentors.

However, prior to this study there was a growing perception that resources and productivity were declining. Concern over these perceived trends by five private foundations with interests in the natural sciences (Research Corporation, the M. J. Murdock Charitable Trust, the W. M. Keck Foundation, the Welch Foundation, and the Camille and Henry Dreyfus Foundation, Inc.) prompted the intensive data collection and analyses for *Academic Excellence: A Study of the Role of Research in the Natural Sciences at Undergraduate Institutions.*

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